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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,888	12/21/2005	Akihiro Kawase	011.2-11893-US01	9697
490 7590 03/06/2008 VIDAS, ARRETT & STEINKRAUS, P.A. SUITE 400, 6640 SHADY OAK ROAD EDEN PRAIRIE, MN 55344				
EXAMINER				
TRAN, BINH X				
ART UNIT		PAPER NUMBER		
1792				
MAIL DATE		DELIVERY MODE		
03/06/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/533,888

Applicant(s)

KAWASE ET AL.

Examiner

Binh X. Tran

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 11/16/06; 06/06/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to applicant's status letter of 8-27-2007.

Applicants are notified the previous examiner Lynette Umez-Eronini is no longer at the patent office and the examiner Binh X Tran will be handling this case.

The previous oral restriction made by examiner Umez-Eronini on 11-27-2006 is withdrawn because it was determined that the claims are non-restrictable. As a result, the following office action addresses all pending claims (i.e. claims 1-16).

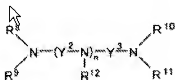
Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, 8, 9, 16, the chemical formula



is indefinite when $n = 0$. When $n = 0$, the formula R^{12} , Y^2 and N inside the parenthesis, is empty as shown below, and the formula Y^3 is connect to N on the right hand side, but connect to nothing on the left hand side as shown below

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In claims 7, 15 the chemical formula is indefinite when $n = 0$ for the same reason as discussed above.

Claims 2-7, 10-15 are indefinite because they directly or indirectly dependent on indefinite claims 1 or 9.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

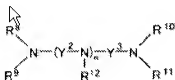
4. Claims 9-13, 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Sugihara et al. (US 5,705,089).

Respect to claim 9, Sugihara discloses a composition comprising:

an alkaline compound (i.e. ammonia or tetramethylammonium hydroxide), water and a chelating agent comprises ethylenediaminetetramethylenephosphonic acid (EDTMP) (See col. 3 lines 35-40, col. 5 lines 18-30, col. 6 lines 18-40, Table 1)

Note: EDTMP read on applicant's formula

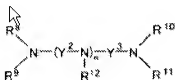
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wherein in the chemical formula, each of Y^2 and Y^3 represents an alkylene group, n is an integer of 0 to 4, each of $4+n$ substituents represented by R^8 to R^{12} is an alkyl group and at least four of the alkyl groups have a phosphonic acid group.

Respect to claims 10-11, Sugihara discloses the chelating agent is ethylenediaminetetramethylenephosphonic acid (EDTMP) (Table 1), therefore the alkylene group is a lower alkylene group (i.e. ethylene) having 2 carbon atoms (read on applicant's range of "1 to 4 carbon atoms"), and the alkyl group is a lower alkyl group (i.e. methyl) having 1 carbon atoms (read on applicant's range of "1 to 4 carbon atoms"). Respect to claim 12, Sugihara discloses all the alkyl groups having a phosphonic acid group (i.e. tetramethylenephosphonic). Respect to claim 13, Sugihara discloses the chelating agent is selected from ethylenediaminetetramethylenephosphonic acid (EDTMP) (Table 1). Respect to claim 15, Sugihara discloses wherein the n in the chemical formula is an integer of 0 to 2.

Respect to claim 16, Sugihara discloses preparing a composition comprises a chelating agent (EDTMP), an alkaline compound (i.e. ammonia or tetramethylammonium hydroxide), water and rinsing the surface of the silicon wafer by using the composition (See col. 3 lines 35-40, col. 5 lines 18-30, col. 6 lines 18-40, Table 1). Note: EDTMP read on applicant's formula



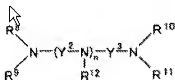
5. Claims 9-13, 15-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 2004/0029395 A1).

Respect to claim 9, Zhang discloses a composition comprising:

an alkaline compound (i.e. amine or ammonium hydroxide), water and a chelating agent comprises ethylenediaminetetramethylenephosphonic acid (EDTMP)

(See paragraph 0042)

Note: EDTMP read on applicant's formula



wherein in the chemical formula, each of Y² and Y³ represents an alkylene group, n is an integer of 0 to 4, each of 4+n substituents represented by R⁸ to R¹² is an alkyl group and at least four of the alkyl groups have a phosphonic acid group.

Respect to claims 10-11, Zhang discloses the chelating agent is ethylenediaminetetramethylenephosphonic acid (EDTMP) (paragraph 0042), therefore the alkylene group is a lower alkylene group (i.e. ethylene) having 2 carbon atoms (read on applicant's range of "1 to 4 carbon atoms"), and the alkyl group is a lower alkyl group (i.e. methyl) having 1 carbon atoms (read on applicant's range of "1 to 4 carbon atoms").

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Respect to claim 12, Zhang discloses all the alkyl groups having a phosphonic acid group (i.e. tetramethylenephosphonic). Respect to claim 13, Zhang discloses the chelating agent is selected from ethylenediaminetetramethylenephosphonic acid (EDTMP) (paragraph 0042). Respect to claim 15, Zhang disclose of chelating agent is EDTMP (read on applicant's formula wherein the n in the chemical formula is an integer of 0 to 2).

Respect to claim 16, Zhang discloses preparing a composition comprises an alkaline compound, water, chelating agent (EDTMP) to clean the semiconductor substrate (paragraph 0042), wherein the substrate includes silicon substrate (paragraph 0044).

6. Claims 1-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Oshima (US 2002/0194789 A1).

Respect to claims 1 and 8, Oshima discloses a composition for polishing a silicon substrate comprising a chelating agent, a silicon dioxide abrasive (paragraph 0045), alkali compound (i.e. KOH, 0055) and water (0053), wherein the chelating agent is selected from the group consisting of ethylenediaminetetramethylenephosphonic acid and diethylenetriaminepenta(methylenephosphonic acid) (See paragraph 0050), read on applicant's formula) and polishing the surface of the silicon wafer by using the polishing composition.

Respect to claim 9, Oshima discloses an identical composition with applicant's invention. However, Oshima does not explicitly disclose the composition is used for rinsing a silicon wafer. However, the composition claim covers what a composition is,

not what a composition does. Thus, the examiner does not give any patentable weight on the intended use. Further, the MPEP 2111.02, (II) states, "If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction".

Respect to claims 2-3 and 10-11, Oshima discloses the chelating agent is ethylenediaminetetramethylenephosphonic acid and diethylenetriaminepenta(methylenephosphonic acid), (paragraph 0050) therefore the alkylene group is a lower alkylene group (i.e. ethylene) having 2 carbon atoms (read on applicant's range of "1 to 4 carbon atoms"), and the alkyl group is a lower alkyl group (i.e. methyl) having 1 carbon atoms (read on applicant's range of "1 to 4 carbon atoms"). Respect to claims 4 and 12, Oshima discloses all the alkyl groups having a phosphonic acid group (i.e. tetramethylenephosphonic or pentamethylenephosphonic). Respect to claims 5 and 13, Oshima disclose the chelating agent is selected from the group consisting of ethylenediaminetetramethylenephosphonic acid and diethylenetriaminepenta(methylenephosphonic acid) (See paragraph 0050).

Respect to claims 6 and 14, Oshima discloses the pH of the solution is between 7-12, preferably 8-12 for polishing a silicon substrate (paragraph 0059). Respect to claims 7 and 15, Oshima discloses the compound is ethylenediaminetetra(methylenephosphonic acid) and

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diethylenetriaminepenta(methylenephosphonic acid) (read on applicant's formula wherein the n in the chemical formula is an integer of 0 to 2).

7. Claims 9-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Skee (US 2002/0077259 A1).

Respect to claim 9 and 16, Skee discloses a cleaning composition cleaning a silicon substrate comprising a chelating agent (paragraph 0042), alkali compound (base including TMAH) (paragraph 0051-0052), and water, wherein the chelating agent is selected from the group consisting of ethylenediaminetetra(methylenephosphonic acid) (EDTMP) and diethylenetriaminepenta(methylenephosphonic acid) (DETAP; See paragraph 0042, 0152, Table 11a-11b, 0155, read on applicant's formula) and cleaning (or rinsing) the surface of the silicon wafer with the solution.

Respect to claim 10-11, Skee discloses the chelating agent is ethylenediaminetetra(methylenephosphonic acid) (EDTMP) and diethylenetriaminepenta(methylenephosphonic acid) (DETAP) (paragraph 0042, 0152, 0155, Table 11a-11b,) therefore the alkylene group is a lower alkylene group (i.e. ethylene) having 2 carbon atoms (read on applicant's range of "1 to 4 carbon atoms"), and the alkyl group is a lower alkyl group (i.e. methyl) having 1 carbon atoms (read on applicant's range of "1 to 4 carbon atoms"). Respect to claim 12, Skee discloses all the alkyl groups having a phosphonic acid group (i.e. tetramethylenephosphonic or pentamethylenephosphonic). Respect to claim 13, Skee discloses the chelating agent is selected from the group consisting of ethylenediaminetetramethylenephosphonic

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(EDTMP) acid and diethylenetriaminepentamethylenephosphonic (DETAP) acid (See paragraph 0042, 0152, 0155, Table 11a-11b).

Respect to claim 14, Skee discloses the pH of the solution is between 10-13, preferably 8-12, specifically 11.5 and 11.8 (abstract, Table 11a-11b). Respect to claim 15, Skee discloses the compound is ethylenediaminetetra(methylenephosphonic acid) and diethylenetriaminepenta(methylenephosphonic acid) (read on applicant's formula wherein the n in the chemical formula is an integer of 0 to 2).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kido (US 2002/0059755 A1) in view of Carter et al. (US 2003/0082998 A1).

Respect to claims 1 and 8, Kido discloses a composition for polishing a silicon wafer comprising a chelating agent, a silicon dioxide abrasive and water (paragraph 0017-0019, 0022, 0041, 0046), wherein the chelating agent is selected from the group consisting of ethylenediaminetetra(methylenephosphonic acid) and diethylenetriaminepenta(methylenephosphonic acid) (See paragraph 0022, 0041, Kido's claim 6, read on applicant's formula) and polishing the surface of the silicon wafer by using the polishing composition. Kido fails to disclose the composition comprises an alkali compound. In a method for polishing a silicon wafer surface, Kido teaches to use a solution comprises a chelating agent (paragraph 0033), silica dioxide (aka silica abrasive) and alkali compound (paragraph 0017-0019, 0023-0026) in order to control the coagulation concentration of the polishing solution and provide superior polishing rate. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Kido in view of Carter by using alkali compound because it helps to control the coagulation concentration of the polishing solution and provide superior polishing rate.

Respect to claims 2-3, Kido discloses the chelating agent is ethylenediaminetetra(methylenephosphonic acid) and diethylenetriaminepenta(methylenephosphonic acid), therefore the alkylene group is a lower alkylene group (i.e. ethylene) having 2 carbon atoms (read on applicant's range of "1 to 4 carbon atoms"), and the alkyl group is a lower alkyl group (i.e. methyl) having 1 carbon atoms (read on applicant's range of "1 to 4 carbon atoms"). Respect to claim 4, Kido discloses all the alkyl groups having a phosphonic acid group (i.e.

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tetramethylenephosphonic or pentamethylenephosphonic). Respect to claim 5, Kido discloses the chelating agent is selected from the group consisting of ethylenediaminetetra(methylenephosphonic acid) and diethylenetriaminepenta(methylenephosphonic acid) (See paragraph 0022, 0041, Kido's claim 6). Respect to claim 7, Kido discloses wherein the n in the chemical formula is an integer of 0 to 2.

Claim 8 further differs from Kido by the specific pH range of the composition. Carter teaches to pH of the polishing composition is a result effective variable varying from 9-14, preferably 10-13 or 10-12 (paragraph 0029, Table 1). The result effective variable is commonly determined by routine experiment. The process of conducting routine experiments so as to produce an expected result is obvious to one of ordinary skill in the art. Hence, it would have been obvious to one having ordinary skill in the art, at the time of invention, to perform routine experimentation to obtain optimal pH in order to provide an effective polishing rate.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X. Tran whose telephone number is (571)272-1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Binh X Tran
Primary Examiner
Art Unit 1792

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Primary Examiner, Art Unit 1792